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AL LT LV MK RO SI(72) Inventors:  
• Agostini, Astorre  
10091 Alpignano (IT)  
• Martino, Ambrogio  
10074 Lanzo Torinese (IT)

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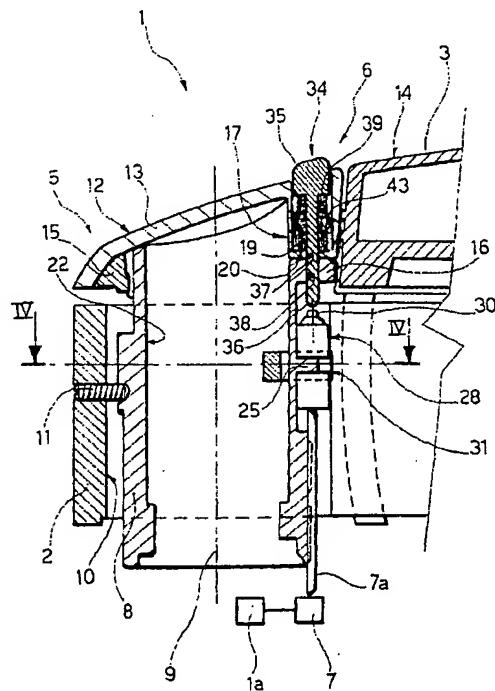
(74) Representative: Cerbaro, Elena, Dr. et al  
STUDIO TORTA S.r.l.,  
Via Viotto, 9  
10121 Torino (IT)(71) Applicant: Valeo Sicurezza Abitacolo S.p.A.  
10026 Santena (IT)

## (54) Vehicle door handle

(57) A handle (1) for a vehicle door, wherein a lever (3) for activating a lock (1a) is hinged to a frame (2) fitable to the door and fitted removably with a tubular body (5) defining a seat for a key cylinder (23) and supporting

a push-button actuating device (6) for activating a security function of the lock (1a); the push-button actuating device (6) being removable from the frame (2) with the tubular body (5).

FIG. 3



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**Description**

[0001] The present invention relates to a vehicle door handle.

[0002] Vehicle, in particular motor vehicle, doors are opened by means of a handle wherein an elongated frame is fixed to the inside of the door and supports a control lever hinged to an end portion of the frame and rotatable with respect to the frame to release a lock.

[0003] Known handles of the above type normally also comprise a tubular body housing a key cylinder, which, when activated, provides for activating and deactivating the security lock function of the respective lock.

[0004] More and more modern vehicles are equipped with electronic devices for remote controlling each door lock and, in particular, activating or deactivating the security function of the lock without using the key. For example, a transmitter or so-called 'badge' is used, which is carried by the user of the vehicle and provides for transmitting signals to a central control unit on the vehicle, which, on receiving and recognizing the signals, deactivates the security function of the lock.

[0005] The same transmitter can also be used to activate the security function of the lock. That is, when the transmitter is a given distance from the vehicle, the central control unit is no longer able to receive the signals emitted by the transmitter, and can be programmed to automatically activate the security function of the lock in the absence of a signal.

[0006] Though reliable, the above electronic device has the drawback that, in most cases, the user of the vehicle wishes to activate the security function of the lock immediately, without waiting for it to be done automatically when the transmitter is a given distance from the vehicle.

[0007] To enable the security function of the lock to be activated and checked immediately, a handle is used comprising a switch located inside the frame at an end portion of the lever, in particular the end portion by which the lever is hinged; and the lever has an appendix which, when the lever is moved towards the door from the rest position to the security lock position and in the opposite direction to the release movement, trips the switch and so activates the security function of the lock.

[0008] The above handle has several drawbacks. In particular, the switch is easily damaged, on account of said security lock movement necessarily requiring, between the frame and the end of the lever in the rest position, a certain amount of clearance by which the switch communicates directly with the outside environment in the event the seal provided is not positioned correctly or is damaged, e.g. by normal operation of the lever. Moreover, in the event of a fault, replacing the switch is an expensive, relatively time-consuming job, which calls for removing the entire handle and, above all, for working from the inside so that the inner door panel and connected devices must be removed and reassembled.

[0009] It is an object of the present invention to provide a handle featuring a device for activating the security function of the relative lock, but which provides for eliminating the aforementioned drawbacks and is easy to assemble and disassemble.

[0010] According to the present invention, there is provided a handle for a door of a vehicle, the handle comprising a frame fittable to said door; a lever connected to said frame and movable, with respect to the frame, between a rest position and an open position opening a lock on said door; and push-button actuating means connectable to said lock to activate a security function of the lock; and being characterized by also comprising a supporting body connected releasably to said frame to support said push-button actuating means.

[0011] A non-limiting embodiment of the invention will be described by way of example with reference to the accompanying drawings, in which:

20 Figure 1 shows a partial front view, with parts removed for clarity, of a preferred embodiment of the handle according to the present invention; Figure 2 shows a larger-scale section along line II-II in Figure 1; Figure 3 shows a partial block diagram and section of the Figure 1 handle along line III-III in Figure 1; Figure 4 shows a section, with parts removed for clarity, along line IV-IV in Figure 3.

25 [0012] Number 1 in Figures 1 and 3 indicates as a whole a handle connectable to a door (not shown) of a vehicle (not shown).

[0013] Handle 1 comprises a frame 2 fittable inside the door (not shown) of the vehicle (not shown); and a lever 3 for activating a lock 1a (Figure 3) on the door (not shown). Lever 3 extends along an axis 4, is hinged at one end (not shown) in known manner to frame 2, and is operated from outside the door (not shown) to move between a rest position and a work position (not shown) releasing lock 1a.

[0014] Handle 1 also comprises a tubular body 5 connected releasably, as explained in detail later on, to an end portion of frame 2; and a push-button actuating device 6 carried by body 5 and connectable by an electric cable 7a to a central control unit 7 (Figure 3) for activating the security function of lock 1a.

[0015] Tubular body 5 comprises an elongated body 8 having an axis 9 and inserted removably through a through seat 10 in frame 2, is fixed axially to frame 2 by a radial pin 11 or, according to a known variation not shown, by means of a bayonet connection, and also comprises a cap 12 which clicks on to elongated body 8 and has a convex outer wall 13 substantially crosswise to axis 9 and defining an extension of an outer wall 14 of lever 3. More specifically, at the opposite end to that facing lever 3, wall 13 rests directly on a convex end of elongated body 8, projects laterally beyond elongated body 8, and is fitted, on the surface facing elongated

body 8, with a catch 15 which clicks on to a corresponding underside recess integral with the outer surface of elongated body 8. At the end facing lever 3, wall 13 rests on an outer end flange 16 of elongated body 8 via the interposition of an appendix 17 in the form of a rectangular parallelepiped with the major axis crosswise to axes 4 and 9, and one of the minor axes, indicated 18, perpendicular to axis 4 and parallel to axis 9. Appendix 17 is hollow and has an inner recess 19, which communicates with the outside through wall 13 and is defined internally by a bottom wall 20 perpendicular to axis 18 and maintained contacting flange 16 by at least two elastic tabs 21, which, as shown in Figure 2, project towards each other from the inner surface of wall 13 and click on to flange 16.

[0016] As shown more clearly in Figure 4, elongated body 8 has a cylindrical axial hole 22 coaxial with axis 9 and housing a key cylinder 23 also coaxial with axis 9. On the side facing lever 3, elongated body 8 is defined externally by a substantially flat surface 24 parallel to axis 9, and from which extend two cylindrical pins 25 crosswise to axis 9, and two axial ribs 26 parallel to axis 9 and defining a cavity 27 parallel to axis 9.

[0017] As shown more clearly in Figure 3, push-button actuating device 6 comprises a switch 28, which is mounted contacting surface 24 inside cavity 27 and is connected to electric cable 7a. Switch 28 is substantially parallelepiped-shaped, has two through holes 29 engaged by pins 25, and comprises a switch push-button 30 (Figures 2 and 3) coaxial with axis 18, movable in a direction parallel to axis 18, and positioned facing the opposite surface of flange 16 to that contacting bottom wall 20 of appendix 17.

[0018] Switch 28 is made integral with elongated body 8 by a substantially U-shaped elastic plate 31 comprising an intermediate plate 32, and two end tabs 33 which click on to respective ribs 26.

[0019] As shown in Figures 2 and 3, recess 19 houses a push-button 34 forming part of push-button actuating device 6 and in turn comprising a head 35 projecting partly from recess 19 through wall 13; and a rod 36, which is integral with head 35, extends through recess 19 coaxially with axis 18, and engages in sliding manner a through hole 37 in bottom wall 20 and an opening 38 formed through flange 16. Rod 36 is movable, together with head 35, along axis 18 and in opposition to a spring 39 compressed inside recess 19, to activate switch push-button 30 of switch 28. When pushed back up by spring 39, the return travel of push-button 34 is limited by two appendixes 40, which extend from head 35 parallel to axis 18 and towards bottom wall 20, extend through bottom wall 20, engage in sliding manner respective openings 41, and have respective stop hooks 42 on the free ends. Push-button 34 and, hence, switch 28 are sealed against external agents by a deformable bellows 43, which is coaxial with axis 18, houses rod 36, spring 39 and appendixes 40, and is connected in fluidtight manner to head 35 at one end and to bottom wall

20 at the opposite end.

[0020] Handle 1 as described above is straightforward in design and is particularly advantageous by push-button actuating device 6 being fitted to a tubular body removable from the outside. That is, tubular body 5 being connected releasably and in such a manner as to be removed easily from frame 2, in the event of a fault on switch 28, tubular body 5 is simply released and withdrawn from seat 10 in frame 2 (for which purpose, electric cable 7a connected to switch 28 will be made long enough), elastic plate 31 is removed, and the damaged switch 28 is pulled out.

[0021] Clearly, changes may be made to handle 1 as described herein without, however, departing from the scope of the present invention. In particular, as opposed to being carried by body 5, switch 28 may be fitted to frame 2 in such a position as to be easily accessible from the outside, e.g. after removing body 5.

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## Claims

1. A handle for a door of a vehicle, the handle (1) comprising a frame (2) fittable to said door; a lever (3) connected to said frame (2) and movable, with respect to the frame (2), between a rest position and an open position opening a lock (1a) on said door; and push-button actuating means (6) connectable to said lock (1a) to activate a security function of the lock (1a); and being characterized by also comprising a supporting body (5) connected releasably to said frame (2) to support said push-button actuating means (6).
2. A handle as claimed in Claim 1, wherein said push-button actuating means (6) comprise a switch (28); and an operating push-button (34) fitted to said supporting body (5) to move, with respect to the supporting body (5), to and from an activating position activating said switch (28).
3. A handle as claimed in Claim 1 or 2, wherein said supporting body (5) comprises a cap (12); an elongated body (8); and click-on connecting means (15, 21) for connecting said cap (12) and said elongated body (8) to each other.
4. A handle as claimed in Claims 2 and 3, wherein said operating push-button (34) is connected to said cap (12), and said switch (28) is connected to said elongated body (8).
5. A handle as claimed in Claim 4, wherein said cap (12) comprises an outer wall (13), and has a recess (19) communicating externally through said outer wall (13) and housing said operating push-button (34).

6. A handle as claimed in Claim 5, wherein said recess (19) comprises a bottom wall (20) having at least one hole (37); and said operating push-button (34) comprises a head (35), and a rod (36) integral with said head (35) and sliding through said hole (37) to and from said activating position activating said switch (28). 5

7. A handle as claimed in Claim 6, wherein said switch (28) comprises a switch push-button (30) coaxial with said rod (36). 10

8. A handle as claimed in Claim 6 or 7, wherein said operating push-button (34) comprises at least one appendix (40) extending from said head (35) towards said bottom wall (20); said appendix (40) being mounted to slide through a respective opening (41) in said bottom wall (20), and comprising an end stop hook (42); and a spring (39) being compressed between said head (35) and said bottom wall (20). 15 20

9. A handle as claimed in Claim 8, and comprising fluidtight means (43) for isolating said switch (28) from the outside; said fluidtight means (43) being interposed between said head (35) and said bottom wall (20). 25

10. A handle as claimed in Claim 9, wherein said fluidtight means (43) comprise a deformable bellows (43); said deformable bellows (43) housing said rod (36) and said appendix (40). 30

11. A handle as claimed in one of Claims 4 to 10, wherein said elongated body (8) has an outer surface (24); said switch (28) being fitted releasably to said elongated body (8) and in contact with said outer wall (24). 35

12. A handle as claimed in Claim 11, and comprising click-on fastening means (31) for connecting said switch (28) to said elongated body (8). 40

13. A handle as claimed in Claim 11 or 12, wherein said outer surface (24) comprises two ribs (26) and at least one pin (25), and said switch (28) has a hole (29) for housing said pin (25); said click-on fastening means (31) being defined by an elastic plate (31) which clicks on to said ribs (26). 45

FIG. 1

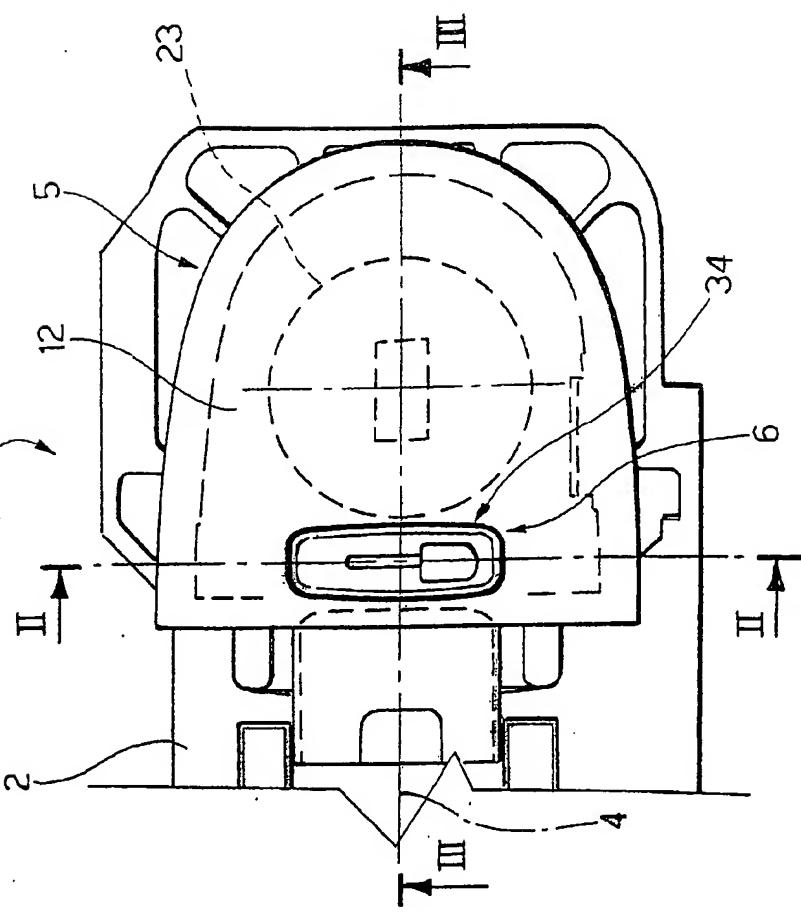


FIG. 4

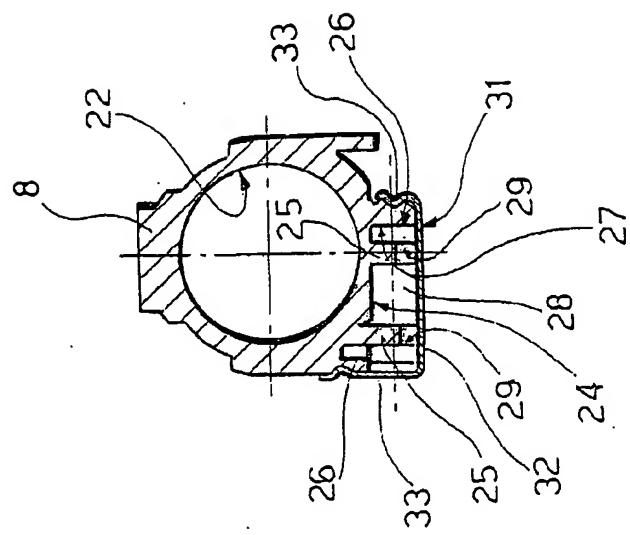


FIG. 2

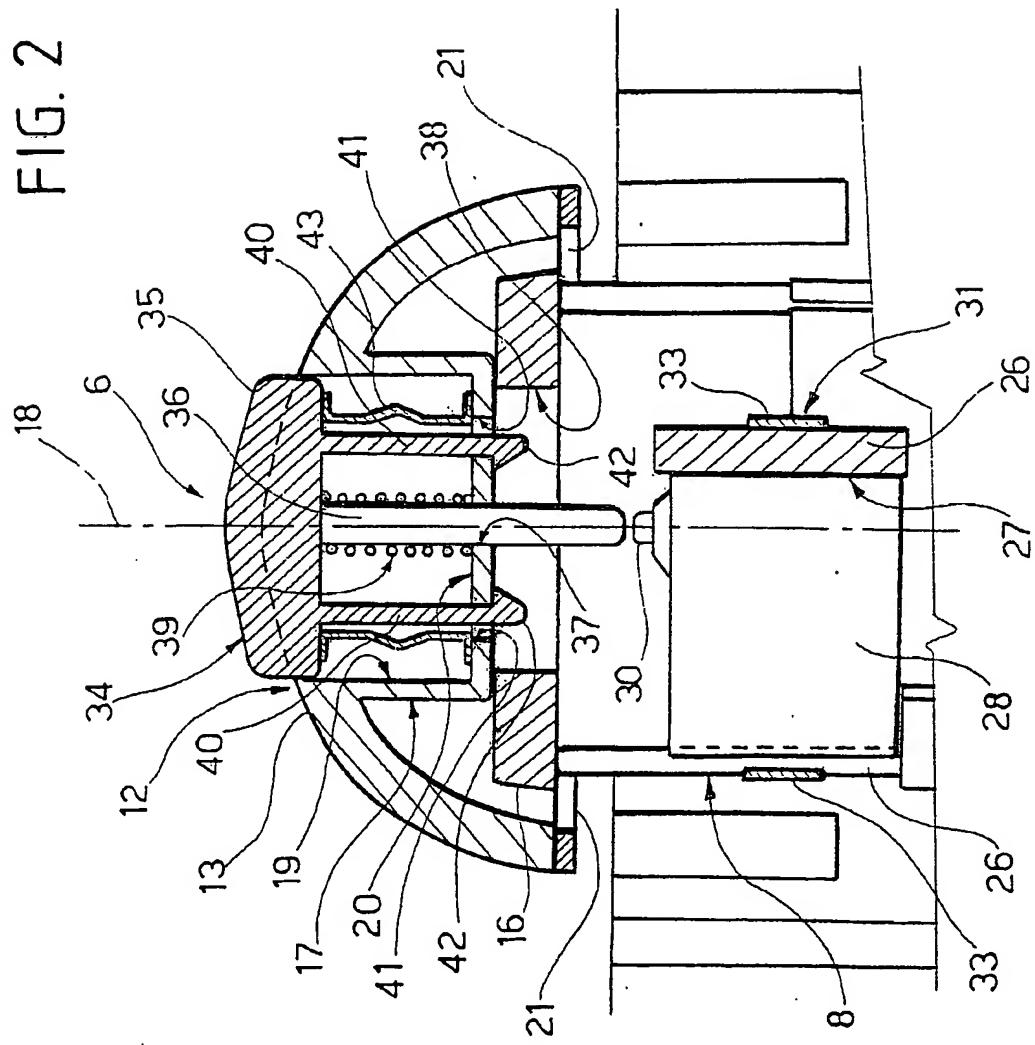
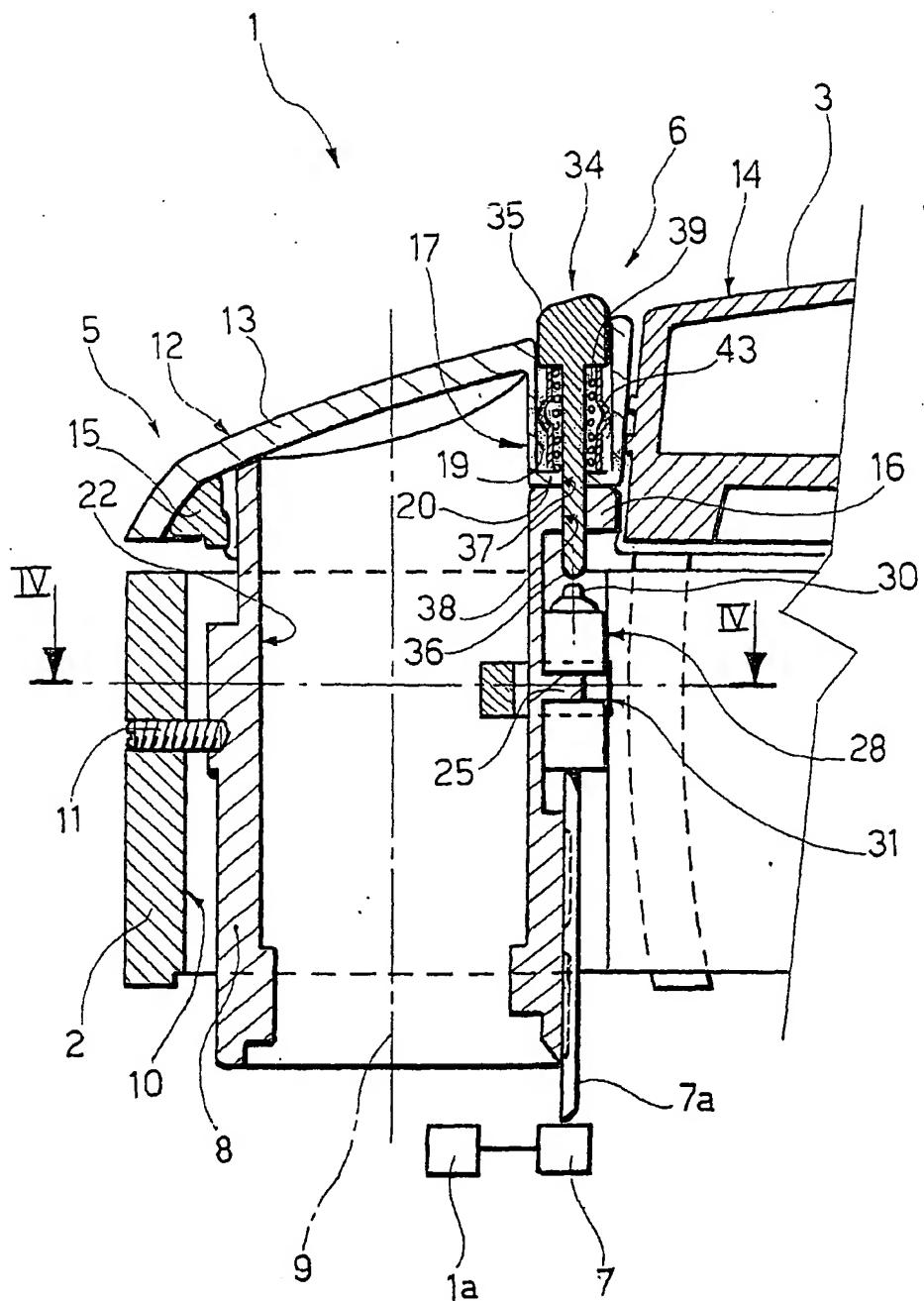


FIG. 3





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## EUROPEAN SEARCH REPORT

Application Number  
EP 01 10 4176

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	EP 0 276 972 A (ROLLS ROYCE MOTOR CARS) 3 August 1988 (1988-08-03) * column 2, line 38 - column 3, line 53; figures 1-4 *	1-13	E05B7/00 E05B65/20
A	EP 0 646 688 A (YMOS AG IND PRODUKTE) 5 April 1995 (1995-04-05) * page 3, line 42 - page 6, line 19; figures 1-3 *	1-13	
A	US 4 482 179 A (JOHNSON JAMES J) 13 November 1984 (1984-11-13) * the whole document *	1-13	
A	US 4 886 310 A (CYR RICHARD A ET AL) 12 December 1989 (1989-12-12) * the whole document *	1-5	
A	US 5 725 262 A (KRITZLER DIETMAR) 10 March 1998 (1998-03-10) * the whole document *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E05B
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
MUNICH	22 June 2001	Friedrich, A	
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ON EUROPEAN PATENT APPLICATION NO.**

EP 01 10 4176

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22-06-2001

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0276972	A	03-08-1988	AU	589830 B	19-10-1989
			AU	1094288 A	04-08-1988
			DE	3866711 A	23-01-1992
			ES	2029005 T	16-07-1992
			JP	2527780 B	28-08-1996
			JP	63297675 A	05-12-1988
			US	4883296 A	28-11-1989
EP 0646688	A	05-04-1995	DE	4405383 A	06-04-1995
			DE	59401325 D	30-01-1997
US 4482179	A	13-11-1984	DE	3345488 A	20-06-1984
			GB	2131865 A, B	27-06-1984
US 4886310	A	12-12-1989	NONE		
US 5725262	A	10-03-1998	DE	19524568 A	05-12-1996
			DE	29521917 U	17-09-1998
			ES	2150319 A	16-11-2000
			GB	2301615 A, B	11-12-1996